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GB 2162238 A US 5022719 A US 5003741 A

(58) Field of Search

UK CL (Edition M) A4B, B8P

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ONLINE DATABASE: WPI

## (54) Construction of display cabinets

(57) A method of constructing a cabinet eg a glass sided display case comprising the following steps:

- (i) Providing (a) a plurality of elongate frame elements 13 and side panels 11; (b) a corner forming means Fig 3 shaped to correspond to the desired shape of the corner and adapted to join frame elements to form a corner; and (c) clamping means 14 adapted to clamp the side panels to the frame elements;
- (ii) Joining said frame elements together by said corner forming means to form the cabinet frame; and
- (iii) Inserting one or more side panels of the cabinet into place to be held between the frame elements of the assembled cabinet frame; and
- (iv) Clamping the side panel(s) in place using the clamping means; and
- (v) Repeating steps (ii) to (iv) until all faces of the cabinet have been constructed.

The method enables one person to progressively construct a complete cabinet.

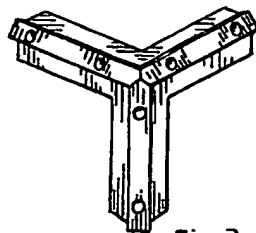


Fig. 3

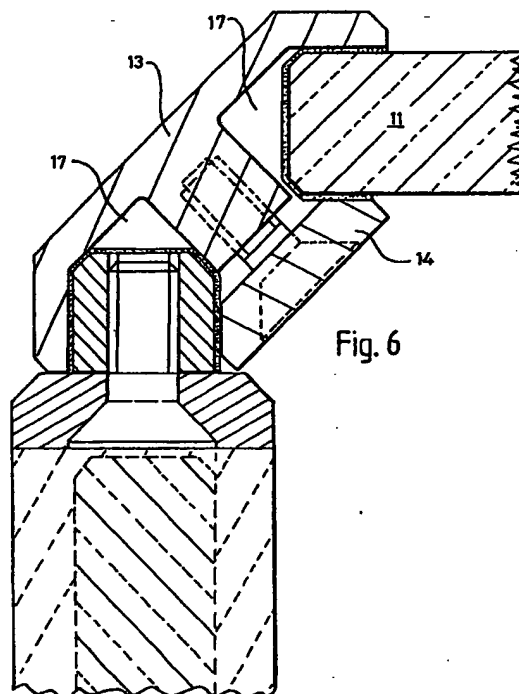


Fig. 6

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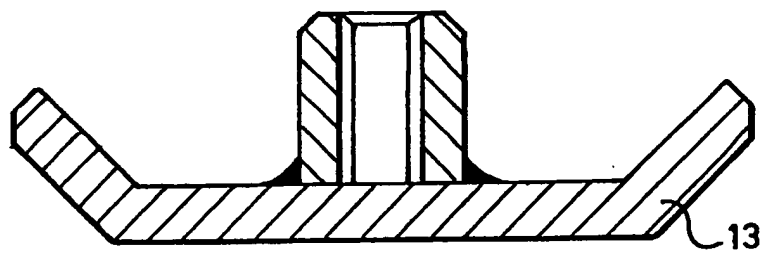
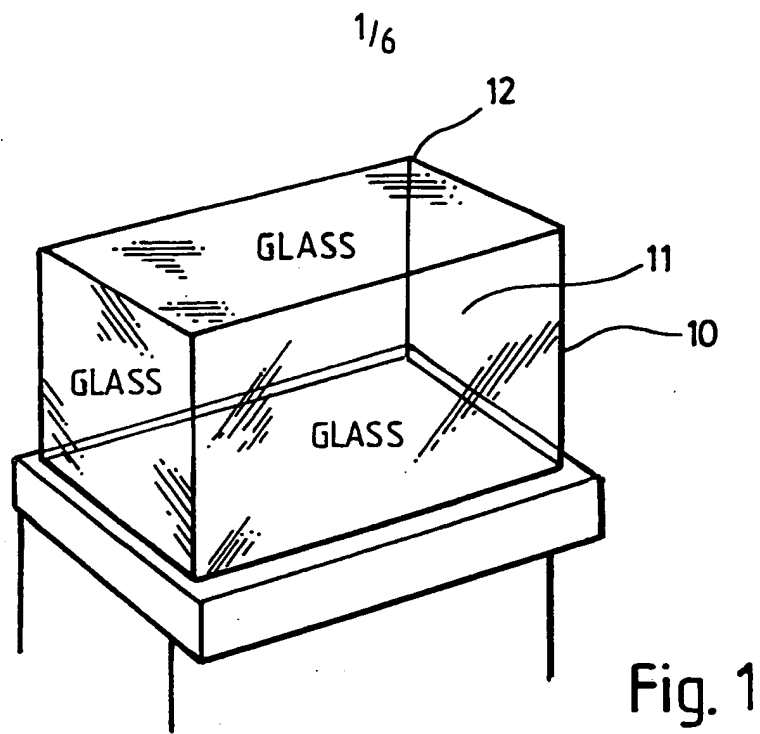


Fig. 2

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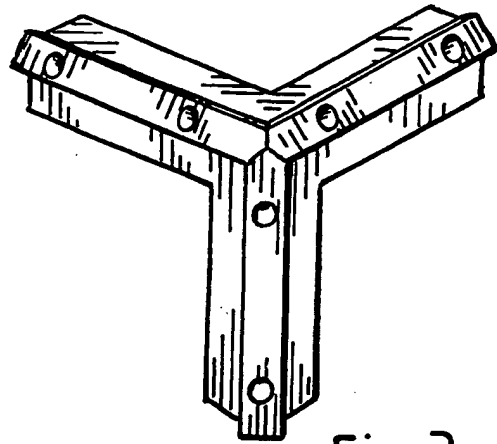


Fig. 3

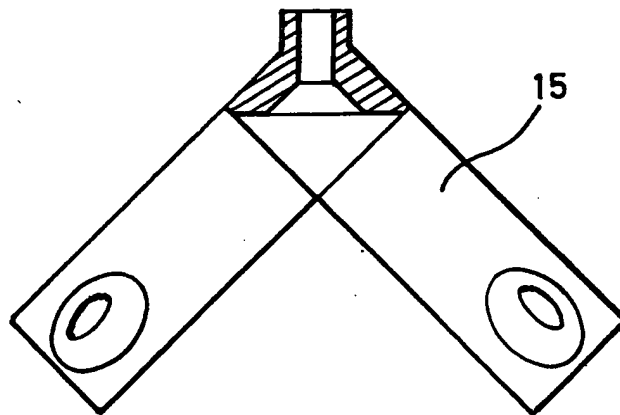
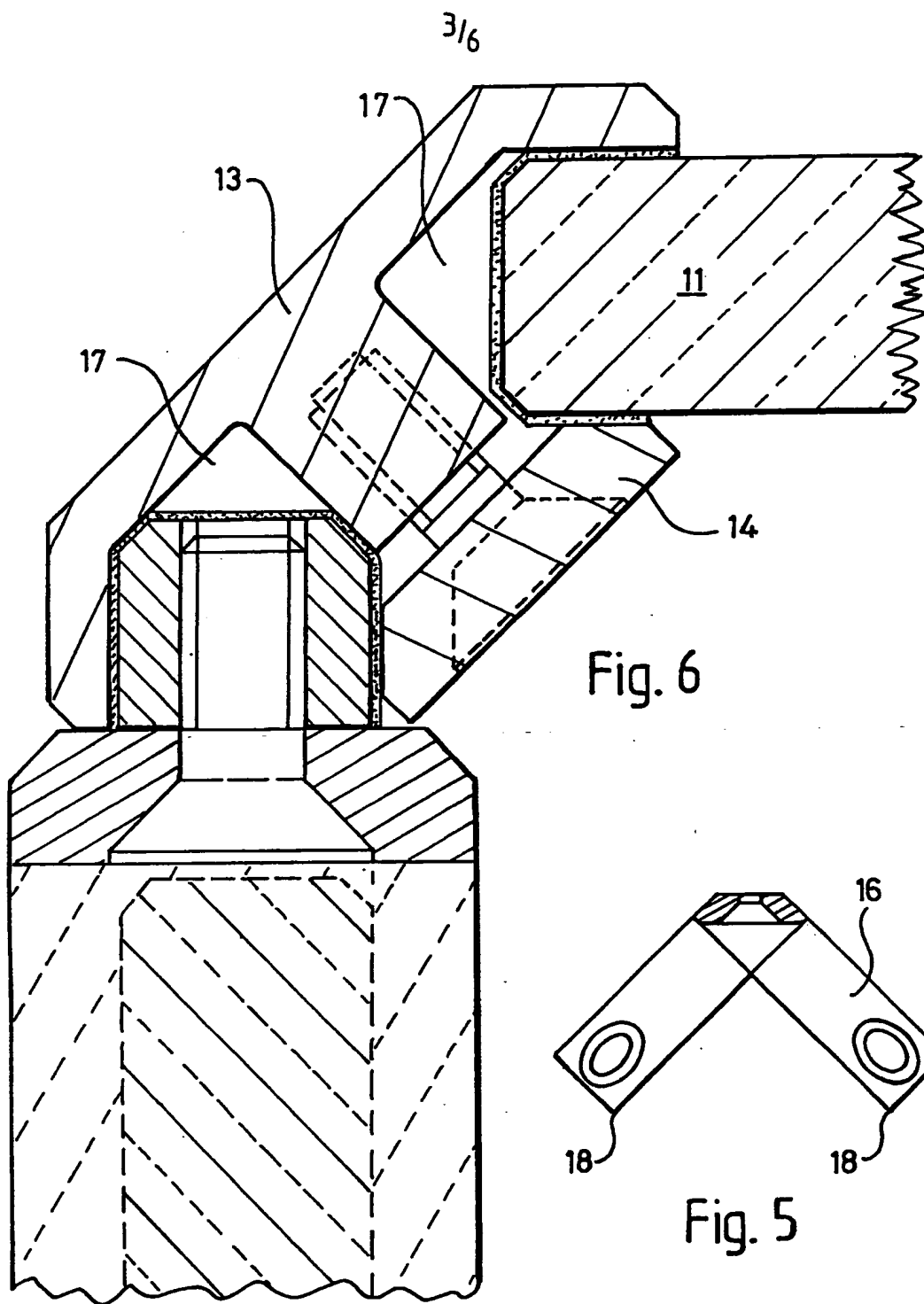


Fig. 4



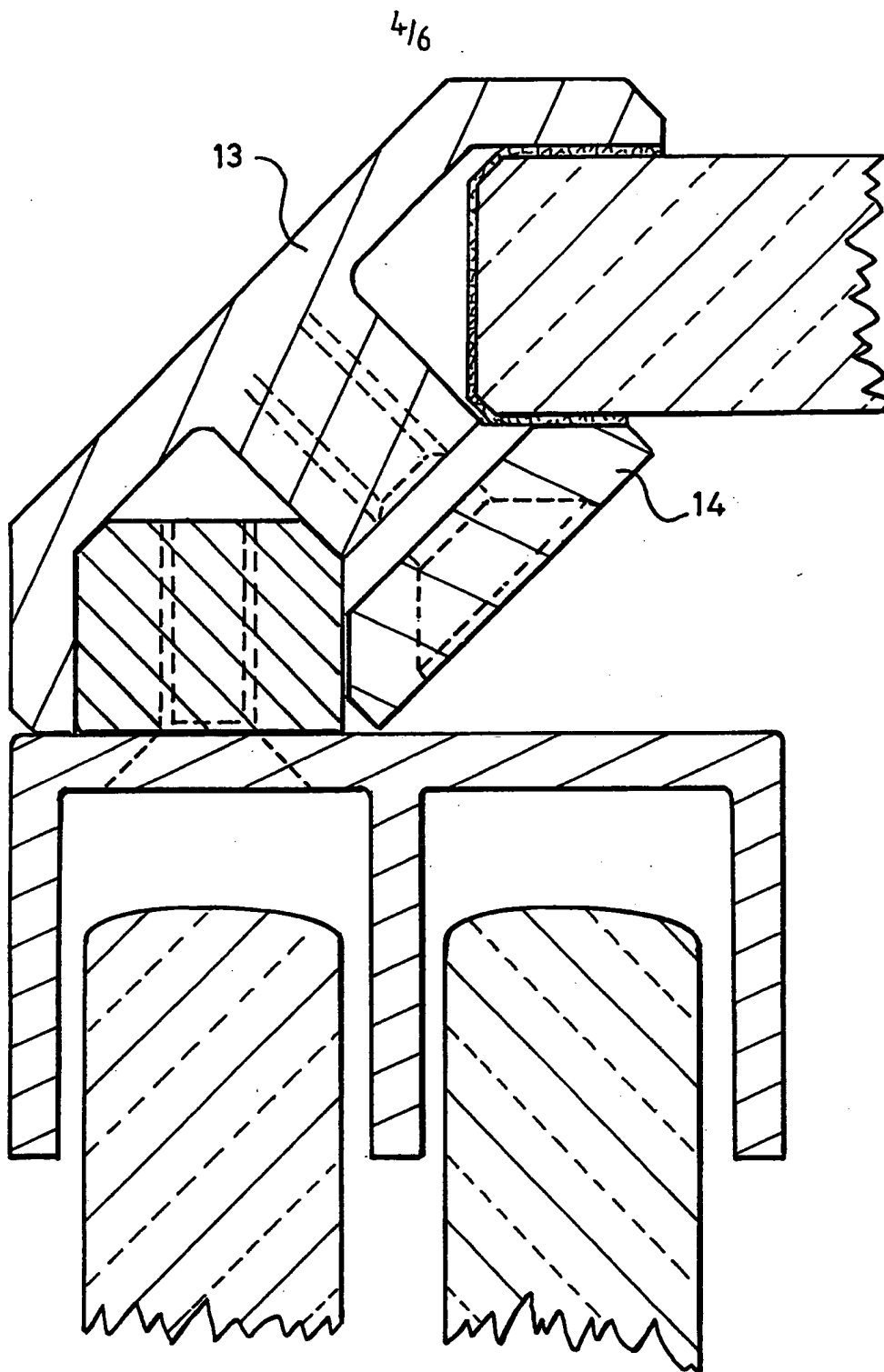


Fig. 7

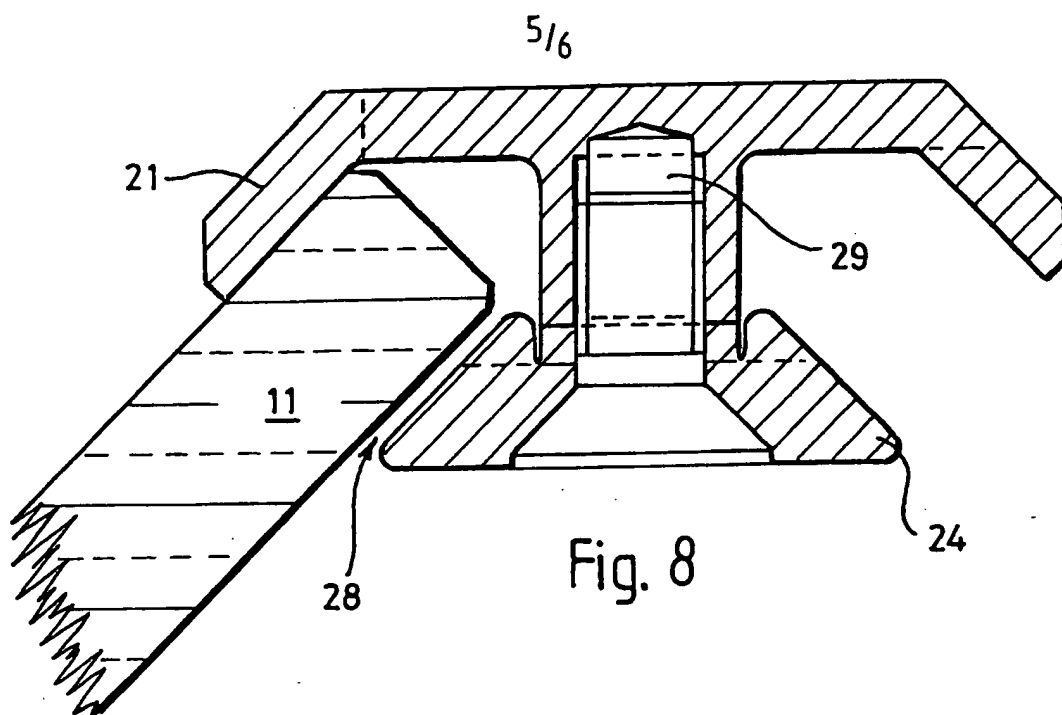


Fig. 8

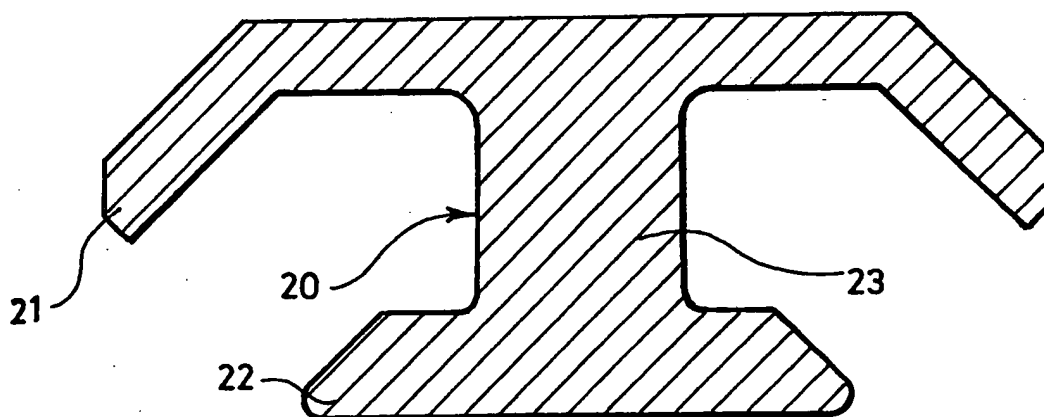


Fig. 9



Fig. 10

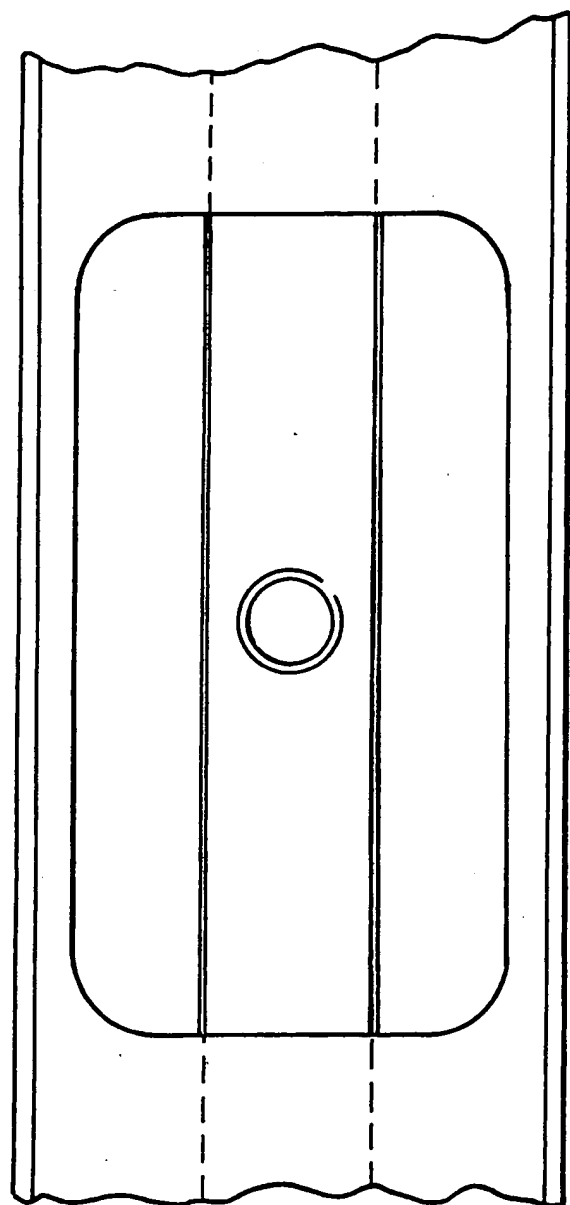
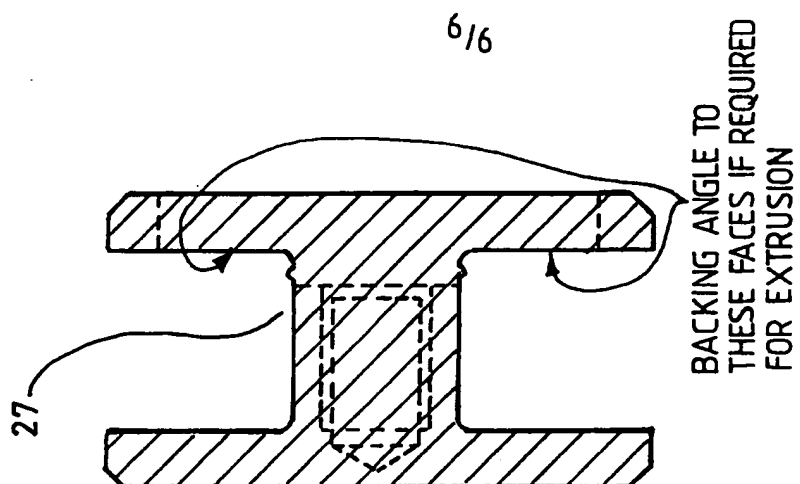


Fig. 11

## **CONSTRUCTION OF DISPLAY CABINETS**

### **Field of the Invention**

The invention relates to the construction of cabinets. As used herein the term cabinet encompasses boxes, cases, display cases and the like.

- 5      The invention is particularly, but not exclusively applicable to the construction of glass-sided display cases.

### **Background to the Invention**

- 10      There is a continuing requirement by retailers to display goods for sale in full view of the buying public but without the would-be purchaser being able to handle the goods, unless under the supervision of a sales assistant. In these circumstances, it is most usual to put the goods in a glass-sided display cabinet.

- 15      A visit to any department store will demonstrate how widely used glass display cabinets are, where, in fact, they will often be found acting as sales counters as well.

- It is a requirement of their use that these glass display cabinets must be attractive to look at and provide an as uninterrupted view as possible of the goods inside. Almost inevitably, this involves using a rigid frame, comprising metal or plastic frame elements, into which panes of glass are inserted.

- 20      A variety of methods have been developed for constructing such cabinets.



5 The nearest art currently known to the applicant is exemplified by cabinets made by UMDASCH GmbH, in which the edges of the glass side panels are accurately machined and then glued to the frame elements. Construction is affected by attachment of the side panels of the cabinet to the frame elements one after another or in combination, until the finished article is produced. In this context, the term side panel also encompasses a top or bottom panel.

10 This method has its drawbacks, namely the fact that the edges of each and every side have to be accurately machined, both with regard to the smoothness of the edge and also the angle of each side, one with another. Furthermore assembly of such a cabinet is a multi-handed job because it is necessary to steady at least two, if not three frame elements and, two side panels simultaneously whilst at the same time lining up the ends of the frame elements at one corner to form a neat joint. In addition, if one side panel becomes broken or damaged, as is often the case, it is a complicated and expensive operation to replace a damaged side panel. Almost invariably, the whole display cabinet must be taken out of use while the repair is effected.

20 It is the object of the present invention to provide a simplified method of construction which avoids the necessity to accurately machine the side panels and which enables side panels to be replaced easily and conveniently in situ.

#### Summary of the Invention

According to a first aspect of the present invention, in its broadest sense, there is provided a method of constructing a cabinet comprising the steps of:

- 25 (i) Providing a plurality of longitudinally extending frame elements and side panels and, for each corner of the cabinet frame, a corner forming means shaped to correspond to the desired shape of the corner and adapted to join together ends of said frame elements to form the corner;
- (ii) Joining said frame elements together by said corner forming means to

form the cabinet frame; and

- (iii) Inserting the side panels of the cabinet into place to be held between the frame elements of the assembled cabinet frame.

5      Advantageously the side panels of the cabinet may be secured to the frame elements by attaching a back plate to each of the frame elements, said back plate being adapted to grip the side panels whilst being secured to but distanced from the frame element.

The corner forming means may, if desired, be removed from the assembled cabinet and be replaced by sections of back plate.

10      Advantageously the corner forming means may be replaced by a corner back plate which comprises sections of back plate joined at a focal point and at angles which correspond with the angles of the corner forming means.

15      According to a second aspect of the invention there is provided a corner forming means for use in the method described hereinabove which corner forming means comprises a plurality of elongate members joined at a focal point at the angles required in a particular corner of the cabinet to be constructed, said members being adapted to co-operatively engage with and be bolted or screwed to said longitudinally extending frame elements such that together they form a corner of the cabinet of the required configuration  
20      such that the said side panels of a cabinet can be inserted into position without hindrance from the corner forming means.

A cabinet constructed by the method of the first aspect of the present invention.

25      Advantageously the frame elements, the side panels, and the back plates when assembled to form the cabinet provide at their juncture one or more wire-ways to enable lights or other electrical devices to be installed in association with the cabinet.

The longitudinally extending frame elements and the co-operating back plates may be adapted to accommodate a sliding or hinged door in place of a static side panel or part of a static side panel.

Brief Description of the Drawings

- 5        A preferred embodiment of the present invention will now be more particularly described by way of example, with reference to the accompanying drawings, wherein:

Figure 1 is an isometric view of a rectangular glass display cabinet embodying the invention;

- 10       Figure 2 is a cross section through a frame element of the Figure 1 embodiment;

Figure 3 is a diagrammatic perspective representation of a corner fixing means of the Figure 1 embodiment;

Figure 4 is a sectional view of a corner forming means along line A-A.

- 15       Figure 5 is a similar sectional view of a corner back plate embodying the invention.

Figure 6 shows a cross section of an assembled corner of a cabinet embodying the invention, incorporating a hinged door.

- 20       Figure 7 shows a cross section of an assembled corner of a cabinet embodying the invention incorporating sliding doors.

Figure 8 shows a cross-section through a frame element and clamping means of a second embodiment of the invention;

Figure 9 shows a similar cross-section through a frame element of the second embodiment;

Figure 10 is a cross-section through the clamping means of the second embodiment;

Figure 11 shows a mid-rail assembly for edge-to-edge abutment of two side panels.

5      Description of the Preferred Embodiment

The embodiments shown respectively in figures 1-7 represent currently the best ways known to the applicant of putting the invention into practice. But they are not the only ways in which this can be achieved. They are illustrated, and they will now be described, by way of example only.

10      Figure 1 shows a type of glass-sided display cabinet 10 of a type widely used in retail outlets. The side panels 11 of this particular cabinet are made of glass and where the panels meet, i.e. at each edge, the side panels are retained in a frame 12, generally made of metal. In the present embodiment, the assembled frame comprises two separate metal extrusions shown more  
15      clearly in figure 6.

A longitudinally extending frame element 13 (see Figure 2) forms an outer most, in use, edge of the cabinet 10 where two side panels meet and bolted to this frame element, inside the display cabinet, is a back plate 14, the frame element 13 and the back plate 14 co-operating together to clamp in place two  
20      adjacent side panels.

It will be appreciated that the two elements of the frame 13 and 14 overlap the edge of a side panel 11 and co-operate in such a way that they can accommodate irregularities in the edges of the side panels and there is no longer any need for these edges to be accurately machined.

25      Construction of the display cabinet is achieved by first forming an external corner of the frame 12 by clamping together two or three frame elements 13 using a rigid corner forming means 15 (shown in figures 3 and 4). This corner forming means 15 secures these frame elements 13 in a fixed

configuration to establish a corner with the desired angles whilst still allowing the side panels 11 to be inserted into place. It will be appreciated that with a corner pre-formed in this manner, it is a relatively simple matter to slide into place two adjacent side panels 11 and clamp these in position with a single back plate 14.

Once all the side panels 11 which engage with the corner under construction have been secured in place, the corner forming means 15 is removed and a corner back plate 16 (see figure 5) inserted and secured in its place.

The corner back plate 16 differs from the corner fixing means 15 in that the former makes contact with the side panels along substantially the whole length of each arm and when screwed or bolt into position serves to clamp the side panels against the outer frame elements.

The corner forming means 15 thus acts as a form of jig to hold the outer frame elements 13 rigidly in position about a corner. An inventive feature of the corner forming means 15 is that it is designed and adapted so as to allow side panels to be fully located and found into position about that particular corner whilst still holding the outer frame elements 13 rigidly in position. That is to say, the corner forming means does not interfere with the positioning of side panels.

If electric lights or other items of electrical equipment are required within the display cabinet, wiring can be drawn through the cavities providing wireways 17 which are created between the side panels 11 and the frame element 13 and back plate 14.

The side panels 11 can be constructed from a wide variety of materials. Furthermore an assortment of features such as sliding or hinged doors (see figures 6 and 7) can be incorporated by techniques well-known in this field of engineering and which do not form part of the present invention in themselves.

A second embodiment of the present invention is shown in figures 8-10

inclusive. In the previous embodiment the outer frame elements 13 and back plates 14 were separately components. This has disadvantages in that the back plates must be cut separately to the exact length required and the correct number of plates must be provided to the cabinet maker. Furthermore, due to their size and shape the back plates can be both liable to damage and are awkward to fit. Although these plates 14 are secured to the frame elements 13 at intervals along their length the main clamping effect is in fact in the region of the securing points.

In the second embodiment the backing plate and the outer frame element have been incorporated into a single extrusion or frame element 20. This comprises a portion 21 corresponding to the outer frame element 13 and an integral back plate 22 joined to the portion 21 by a neck portion 23. The shape and configuration of the back plate portion 22 in relation to the outer frame element 21 are such that side panels can be slide into position but at this stage of assembly are not clamped.

Clamping action is provided by clamp pieces 24 shown in figure 10. These clamp pieces are relatively short in length compared to the length of the frame element 20 and fit into gaps provided for that purpose. Figure 8 shows a cross-section of a clamp piece 24 fitted into just such a gap. Thus tightening fixing bolt 26, which engages with a threaded hole 29 in the neck portion 23, brings the face 25 of the clamping piece into contact with the side panel 11 ultimately clamping it between face 25 and the outer portion of the frame element 21.

This principle of clamping can also be used when joining panels edge-to-edge in a linear arrangement using a mid-rail section 27 as illustrated in figure 11.

It is usual in these circumstances to protect the edge of each side panel with tape to act as a gasket or plastic interleaf between the panel, which is usually glass, and the metal frame. This gasket can be seen as 28 in figure 8.

It will be appreciated that this method of construction not only simplifies assembly, turning it from what is usually a multi-handed job to a single-

handed task, but also dictates that the strength of the cabinet now draws heavily from the strength of the side panels rather than being purely dependent on the strength of the frame itself.

5       The precise details needed to put the invention into practice will form an inevitable part of the common general knowledge of the intended skilled addressee of this specification.

Claims

1. A method of constructing a cabinet comprising the following steps:
  - (i) Providing (a) a plurality of longitudinally extending frame elements and side panels; (b) a corner forming means shaped to correspond to the desired shape of the corner and adapted to join together respective ends of said frame elements to form a corner; and (c) clamping means adapted to clamp the side panels to the frame elements;
  - (ii) Joining said frame elements together by said corner forming means to form the cabinet frame; and
  - (iii) Inserting one or more side panels of the cabinet into place to be held between the frame elements of the assembled cabinet frame; and
  - (iv) Clamping the side panel(s) in place using the clamping means; and
  - (v) Repeating steps (ii) to (iv) until all faces of the cabinet have been constructed.
2. A method of constructing a cabinet as claimed in Claim 1 wherein the side panels of the cabinet may be clamped to the frame elements by attaching a back plate to each of the frame elements, said back plate being adapted to grip the side panels whilst being secured to but distanced from the frame elements.
3. A method of constructing a cabinet as claimed in Claims 1 and 2 wherein the corner forming means may, if desired, be removed from the assembled cabinet and be replaced by sections of back plate.
4. A method of constructing a cabinet as claimed in any of Claims 1-3



wherein the corner forming means may be replaced by a corner back plate which comprises sections of back plate joined at a focal point and at angles shaped to correspond with the angles of the corner being formed.

- 5        5.    A method of constructing a cabinet as claimed in any of Claims 1-4 wherein the frame elements, the side panels, and the back plates when assembled to form the cabinet provide at their juncture one or more wire-ways to enable lights or other electrical devices to be installed in association with the cabinet.
- 10       6.    A method of constructing a cabinet as claimed in any of claims 1-5 wherein the frame element incorporates a back plate in a one-piece construction wherein the back plate is joined to an outer frame element by means of a neck, these components being so sized and shaped as to form a channel into which a side panel can slide.
- 15       7.    A method of constructing a cabinet as claimed in any of Claims 1-5 wherein the longitudinally extending frame elements and the co-operating back plates may be adapted to accommodate a sliding or hinged door in place of a static side panel or part of a static side panel.
- 20       8.    A corner forming means for use in a method as claimed in any of Claims 1-7 wherein said corner forming means comprises a plurality of elongate members joined at a focal point at the angles required in a particular corner of the cabinet to be constructed, said members being adapted to co-operatively engage with and be bolted or screwed to  
25       said longitudinally extending frame elements such that together they form a corner of a cabinet of the required configuration, such that the said side panels of a cabinet can be inserted into position without hindrance from the corner forming means.
- 30       9.    A frame element for use in a method as claimed in any of claims 1-7 wherein said frame element comprises an outer frame element and an

5 integral backing plate, joined to the outer frame element by a neck, the components being so sized and shaped that a channel is formed between the outer frame element and the backing plate, said channel being adapted to accommodate a side panel in a sliding fit arrangement, wherein there is further incorporated within the backing plate provision for a clamping means to clamp the side panel to the outer frame element at intervals along its length.

10. A cabinet constructed by the method and using the apparatus as claimed in any of Claims 1-9.
- 10 11. A method of constructing a cabinet as claimed in any of Claims 1-7 as herein described with reference to and as illustrated by the accompanying drawings.

**Patents Act 1977**  
**Examiner's report to the Comptroller under Section 17**  
**(The Search report)**

Application number  
GB 9410598.8

**Relevant Technical Fields**

- (i) UK Cl (Ed.M)      A4B : B8P  
(ii) Int Cl (Ed.5)      A47F : A47B

Search Examiner  
JOHN GRAHAM

Date of completion of Search  
7 SEPTEMBER 1994

**Databases (see below)**

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

Documents considered relevant following a search in respect of Claims :-  
1-7, 10, 11

(ii) ONLINE DATABASE: WPI

**Categories of documents**

- |  |   |
|--|---|
| <p><b>X:</b> Document indicating lack of novelty or of inventive step.</p> <p><b>Y:</b> Document indicating lack of inventive step if combined with one or more other documents of the same category.</p> <p><b>A:</b> Document indicating technological background and/or state of the art.</p> | <p><b>P:</b> Document published on or after the declared priority date but before the filing date of the present application.</p> <p><b>E:</b> Patent document published on or after, but with priority date earlier than, the filing date of the present application.</p> <p><b>&amp;:</b> Member of the same patent family; corresponding document.</p> |
|--|---|

Category	Identity of document and relevant passages	Relevant to claim(s)
A	GB 2162236 (BRAMLEY) see clamp 12	1
X	US 5022719 (AMSTORE) whole document, see particularly Figure 3, corner piece 60	1
A	US 5003741 (YEH) see connector 2, Figure 1	1

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